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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/642,903	08/18/2003	Alan William Atkinson	71013-025	3197

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EXAMINER

POULOS, SANDRA K

ART UNIT	PAPER NUMBER
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1714

DATE MAILED: 10/06/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/642,903

Applicant(s)

ATKINSON ET AL.

Examiner

Sandra K. Poulos

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 August 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 13 and 16-34 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 13 and 16-34 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>11/24/2003</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Specification

1. Applicant is reminded of the proper content of an abstract of the disclosure.

A patent abstract is a concise statement of the technical disclosure of the patent and should include that which is new in the art to which the invention pertains. If the patent is of a basic nature, the entire technical disclosure may be new in the art, and the abstract should be directed to the entire disclosure. If the patent is in the nature of an improvement in an old apparatus, process, product, or composition, the abstract should include the technical disclosure of the improvement. In certain patents, particularly those for compounds and compositions, wherein the process for making and/or the use thereof are not obvious, the abstract should set forth a process for making and/or use thereof. If the new technical disclosure involves modifications or alternatives, the abstract should mention by way of example the preferred modification or alternative.

The abstract should not refer to purported merits or speculative applications of the invention and should not compare the invention with the prior art.

Where applicable, the abstract should include the following:

- (1) if a machine or apparatus, its organization and operation;
- (2) if an article, its method of making;
- (3) if a chemical compound, its identity and use;
- (4) if a mixture, its ingredients;
- (5) if a process, the steps.

Extensive mechanical and design details of apparatus should not be given.

Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

2. The abstract of the disclosure is objected to because of legal phraseology. The words "comprises" in lines 1 and 5 and "said" in line 2 are objected to because of legal phraseology and should be removed from the abstract. Correction is required. See MPEP § 608.01(b).

3. The disclosure is objected to because of the following informalities:

a. In page 4, paragraphs 3 and 5, alkali is spelled two different ways, as "alkalai" and "alkali." Please correct so that both are the same spelling, preferably "alkali."

b. Please replace "eg" with "e.g." in the disclosure because the accepted abbreviation is "e.g." whereas "eg" is a word fragment.

c. In page 5, paragraph (a), the last sentence is not fully understood. It is suggested that it be re-written as: "Specifically, less than 33% of the vermiculite particles are above 45 microns in diameter and have an aspect ratio of at least 10." This sentence also conflicts with information given in the previous sentence, where "at least 90% by weight has a thickness of no more than 30 microns and no dimension greater than 1 mm." This would indicate that at most 10% would have a thickness greater than 30 microns, but the next sentence discloses that up to 33% may be above 45 microns in diameter. Furthermore, "diameter" is normally used to indicated length across a spherical particle, however, because there is an aspect ratio of at least 100, the word "diameter" does not make clear what length is being measured and it is not understood if "diameter" is the same as "thickness". Clarification is requested.

It is to be noted that the applicant may not add new matter to the claims, the specification, or the drawing via amendment. Please refer to MPEP § 608.04 and 37 CFR 1.121 (f).

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 13, 16-34 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. More particularly, claims 16, 20, 27, and 31 recite a "supplementary inorganic resin," wherein it is unclear to one of ordinary skill in the art if this is referring to an inorganic polymer, which the use of the word "resin" implies, or an inorganic binder compound. Attention is drawn to the specification on page 4, wherein there is reference to a "supplementary inorganic binder/adhesion promoter," and compounds such as alkali silicates are noted as being representative of this group. In the specification is no specific reference to a "supplementary inorganic resin" as such. Therefore, it is unclear whether the "inorganic resin" disclosed in the above claims is actually the aforementioned "inorganic binder."

6. Claims 13, 17-19, 21-26, 28-30, and 32-34 are rejected under 35 U.S.C. 112, second paragraph, as being dependent upon a rejected base claim.

7. It is to be noted that for the purposes of examination, the Examiner has assumed that in claims 16, 20, 27, and 31, the phrase "inorganic resin" is meant to be the

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"inorganic binder" disclosed in the specification, for the reasons stated in the above paragraph 5.

8. Claim 13 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In particular, since there is no indication of (a) what applicant means by "theoretical density " in the present context or (b) what the value of that "theoretical density" is supposed to be, it is not possible to ascertain as to when a coating density would meet applicant's criterion.

9. It is to be noted that the applicant may not add new matter to the claims, the specification, or the drawing via amendment. Please refer to MPEP § 608.04 and 37 CFR 1.121 (f).

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.

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3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

11. Claims 13, 16-25, and 27-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Padget et al. (US 4,425,465) in view of Hansen et al. (US 4,379,857) and further in view of JP 5180344 and Terai (US 5,322,299).

12. Padget et al. disclose an aqueous coating composition comprising of chemically delaminated vermiculite lamellae in an aqueous solution or dispersion of a film-forming polymeric binder (abstract). Preferably all vermiculite particles over 20 microns in size are eliminated (column 2, lines 34-43). They have an aspect ratio of at least 10 and up to 10,000 (column 2, lines 6-9). The amount of vermiculite lamellae incorporated in the coating may vary from 2-95%, preferably 20-80% (column 2, lines 57-65). The composition may contain other layered minerals, such as montmorillonite, as flaky fillers. Organic polymers that may be used in the coating are listed in column 3, lines 38-

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68, and column 4, lines 1-19. Examples of compositions similar to the present claims are disclosed in Padget et al. were coated 27-32 microns thick (column 8, lines 15-20).

Examiner's position is that the coating thickness disclosed is representative of all the compositions disclosed by Padget et al. and not limited to this general example. Furthermore, the theoretical density can be assumed to have been met by prior art because the vermiculite was processed in the same manner in both Padget et al. and the present claims; the expansion or swelling of the vermiculite particles would cause a decrease in theoretical density, therefore, it would have been obvious to one skilled in the art that the theoretical density of the coating material disclosed in Padget et al. would meet the limitation in the present claims.

It is also examiner's position that Padget et al. disclose a composition where the weight percent of the polymer is greater than the weight percent of the vermiculite. Vermiculite may vary from 2-95% of the composition (column 2, lines 57-63). At the lower end of the range, the vermiculite would be present in small amounts and if there were not more polymer than vermiculite in that instance, then the coating would cease to be useful because the majority of the composition would be fillers and the composition would no longer act as a coating. Therefore, it is inherent that the invention disclosed by Padget et al. includes compositions where the polymer is present in greater amounts by weight than the vermiculite. It would have been obvious to one skilled in the art that because vermiculite may be present in amounts as low as 2% as disclosed in Padget et al., then the amount of polymer present would inherently be greater than that of vermiculite, and would meet the limitation in the present claims.

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13. The differences between Padget et al. and the presently claimed invention are (i) there is no supplementary inorganic binder such as a metal silicate, (ii) the flaky filler is montmorillonite, not mica, milled thermally exfoliated vermiculite, aluminum flake or a mixture thereof, (iii) there is no mention of using silicone or silicate resin as the organic polymer, (iv) there is no mention if the polymer is heat resistant to 300 degrees Celcius, (v) the composition is not used in coating a gasket or as a seal-enhancing coating, and (vi) the coating thickness from 50 to 70 microns is not disclosed.

14. With respect to the differences in (i)-(ii), Hansen et al. disclose that when alkali silicates such as lithium, sodium, and potassium silicate are used as a binder component in an coating comprising vermiculite (column 1, line 59), organic polymers (column 2, lines 42-44), and mica in the form of flakes (column 2, lines 10-13), the resulting composition has significantly improved toughness, heat resistance, and structural integrity (column 2, lines 67-68; column 3, lines 1-9). Furthermore, Hansen et al. disclose that the mica reinforces the coating and may function as a heat reflector (column 2, lines 7-10).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the composition of Padget et al. so as to include an alkali silicate binder and mica as the flaky filler in light of Hansen et al., thereby obtaining the invention as set forth in the presently cited claims. One would have been motivated to include an alkali silicate binder and mica flakes because the resultant coating would have the improved physical properties discussed above, as taught by Hansen et al.

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15. With respect to the differences in (iii)-(vi), JP'344 discloses a surface layer on a gasket that comprises non-silicon based rubbers, silicone modified polymers, and fillers such as vermiculite, mica, and silicate fibers (abstract). The layer in JP'344 also is disclosed as having a thickness of 0.05-0.5 mm, or 50 to 500 microns (page 4, paragraph 24). The non-silicon rubber, such as a fluorine rubber, and silicone modified polymer are 3-20% of the composition (page 3, paragraph 18). It is known in the art that fluorine and silicone polymers can have good heat resisting properties and can withstand temperatures up to 300 degrees Celsius. The composition disclosed for the surface layer of the gasket in JP'344 is the same as the composition of the coating disclosed by Padgett et al. in view of Hansen et al., therefore, one would have a reasonable expectation of success in using the coating composition for a gasket using the layer thickness given above. One would also have a reasonable expectation of success in using a silicone resin in the coating disclosed by Padgett et al. in view of Hansen et al. because JP'344 teaches that a silicone modified polymer is compatible with vermiculite, silicates, mica, and other polymers and that this composition can be used for a gasket layer. Furthermore, Terao discloses that silicone resins are useful as sealing coatings on metal gaskets (column 1, lines 55-62; column 4, lines 13-16). One would have been motivated to include a silicone resin in the coating because the resultant coating would give improved sealing properties to gaskets, as taught by Terao and JP'344.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the composition of Padgett et al. in view of Hansen et al.

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so as to include a silicone resin in the coating composition and to use the composition for coating a gasket in the above coating thickness in light of JP'344 and Terai, thereby obtaining the invention as set forth in the presently cited claims.

16. Claims 26 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Padget et al. in view of Hansen et al. and further in view of JP'344 and Terai as applied to claims 13, 16-25, and 27-33 above, and further in view of DE4405864 and DE3618786.

Padget et al. in view of Hansen et al. and further in view of JP'344 and Terai disclose the gasket coating explained in paragraphs 11-15 above.

The difference between the gasket coating in Padget et al. in view of Hansen et al. and further in view of JP'344 and Terai, and the presently claimed invention is that the gasket coating further comprises a solid lubricant.

DE'864 teaches the use of hexagonal boron nitride as a lubricant for gaskets, in addition to molybdenum disulphide, graphite or metallic powders, and that these lubricants are compatible with fillers such as mica and other silicates (abstract; page 2, paragraph 3; page 5, paragraph 5).

DE'786 teaches the use of a solid lubricant with a polymeric binder. Also, DE'786 teaches that a coating with solid lubricant protects the gasket from destruction by thermal or extreme fatigue loads (abstract).

One would have been motivated to combine the gasket coating described above with a solid lubricant because of the improved properties taught by DE'786. DE'786 and

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DE'864 disclose that the solid lubricant is compatible with polymers, mica, and silicates, which are components of the present gasket coating; therefore one would have a reasonable expectation of success in using the solid lubricant with the present gasket coating.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the gasket coating of Padget et al. in view of Hansen et al. and further in view of JP'344 and Terai so as to include a solid lubricant in the gasket coating in light of DE'864 and DE'786, thereby obtaining the invention as set forth in the presently cited claims.

Conclusion

17. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Forry (US 6,093,467): Discloses vermiculite, mica, and silicone coatings that give gaskets a better sealing ability.

Bentonite/Montmorillonite data sheet
(http://www.bentonit.ru/en/about_prod/bentonit): Information about montmorillonite.

Silicone Rubber data sheet (<http://www.reissmfg.com/feature.htm>): Properties of silicon rubber.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sandra K. Poulos whose telephone number is (571) 272-6428. The examiner can normally be reached on M-F 7:30-5:00, alternate Fridays off.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on (571) 272-1119. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SKP

Sandra K. Poulos
9/29/05

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